

Green Infrastructure Development within Urban Environment provided by Privately Owned Public Spaces

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Abstract. Since the industrialisation era, there has been a trend towards radial sprawl, rapid development and concentration of people in the largest cities. Historically, people needed space outside their homes to interact and communicate to each other. In the city it was provided by public open space, forming the centres of social life. The conditions and opportunities for people to use outdoor space have also changed with changing eras and political power settings, along with the scale of development, security concerns and ownership of space in the city. The aim of the study is to explore the nature of Privately Owned Publicly – Accessible Spaces (POPS) and their potential development contribution to urban green infrastructure, developing design and planning recommendations for the development of Privately Owned Publicly – Accessible Spaces in the urban environment. The research carried out during the literature review and analysis of city plans of the cities introduced POPS program shows the relevance of the topic of private ownership of public open space in the world's major metropolises, but that it is conceptually possible to adapt it to smaller-scale urban planning, for example by applying it to private investors and developers in their requirements for new buildings and sites development.

Keywords: Privately Owned Publicly – Accessible Spaces, Privately Owned Public Spaces, POPS

Introduction

Historically, people needed space outside the home to interact and communicate, which in the city was provided by public open space, creating centres of social life. But after the 19th century, public space, insofar as it was open and sociable, declined. It was influenced by various social, political and economic factors, which led to the privatisation of people's public life. In turn, the need for security led to the emergence of maintained, closed and controlled spaces [7]. In the further development within the modernist era, the focus of cities, human and social life was replaced by the built environment and machinery, with only small areas allocated for public outdoor space. An inverted and misguided planning principle “buildings – spaces – life” was introduced, even though in traditional planning the city grew out of the rhythms of everyday life and the urban spaces within it [5; 14].

The definition of public open space has been changed over the time - in terms of ownership, management and accessibility. Privately owned public space, which is perceived as publicly accessible open space but with a private owner, is an important part of the city, both visually and functionally, directly affecting the quality of life and well-being of the community.

Quality public space is primarily about the variety of urban spaces that are the hallmark of any vibrant and sustainable urban environment. The green infrastructure and publicly accessible space of a city are one of the key determinants of the quality of life of its inhabitants. Although the concept of 'public open space' itself is a broad one, more

focused on sociology and not spatially defined, it is difficult not to associate it with the urban environment. Public open space simultaneously brings significant economic, social and environmental benefits to local society and its communities. Users of a city outdoor space are diverse and each unique in their own way; depending on their daily needs they all leave their homes and use outdoor space to reach their pinned destinations, that's why public outdoor space shared by these diverse personalities needs to be flexible and adaptable [11]. Public space often serves as a basis for social life activities and can also create a unique sense of belonging for everyone depending on identification himself with a certain public space or part of it. Due to various factors, a broad typology of outdoor spaces has developed, which makes it increasingly difficult to separate private from public outdoor spaces, thus creating also hybrid outdoor spaces, such as privately-owned public spaces [9].

The development of the idea of privately-owned public space can be traced back to the 1960s in New York, USA, as an incentive tool for planning, development and use of land. New York in the late 1800s and early 1900s experienced rapid technical development, reflected in the construction of skyscrapers on any size of plot that designers and developers could find, which naturally reduced the city's resources of light, air, green and open space [8; 1].

The idea of a public private outdoor space came about naturally, as people used to congregate and gather in one particular place next to the building,



Fig. 1. The public open space values of private property [construction by authors]

with the busiest times being at lunchtime. This first Privately-Owned Public Space (also known by the acronym POPS) area took place in the forecourt of the Seagram Building. The building itself was built in 1958 and its forecourt was not planned as a public outdoor space at that time, but organically it became one. In good conditions, up to 150 people a day used the outdoor space to sit, sunbathe, eat and have light conversations [14].

Along with general global development, increase in the number of people and economic growth, the urban landscape in the world's major cities began to become too dense, built-up and technical in the early 20th century. With this growing trend, the demand for well-maintained, accessible and high quality public open space is becoming more and more urgent, which private property can provide alongside public open space. It was not until 1961, the last time New York's zoning was significantly changed, that the Privately-Owned Public Spaces programme, an initiative that has proven its worth over the decades, was established. When POPS was first used as a tool in spatial planning, the programme allowed developers to build more storeys or receive special benefits if they included plazas or passageways in the development that were accessible to the public. While the programme started with the requirement to improve outdoor spaces by allowing light and air flow at street level, over time public outdoor spaces were also enhanced with amenities and elements found in a park - seating, greenery, trees, lighting, accessibility for people with disabilities, and signage - universal design - to make the place understandable and accessible to all [8].

Privately owned public spaces include both indoor and outdoor spaces that are freely accessible and open for public visit and use. They are owned by a private owner - business, office or residential building owner, developer or others - who maintains them, ensures free access and promotes the place in accordance with municipal regulations. Outdoor spaces are primarily intended to be freely accessible at all times or with access restrictions, but by law they should be accessible to the public [12]. Privately owned public space is usually developed

where it is offered by a private developer in return for a development fee that allows for the construction of a taller and larger building, or where public space is identified as a necessity and a condition of development approval. Their use is determined and regulated by the local authority by design, but the public is also encouraged to engage in monitoring through public reporting on the adequacy, maintenance and quality of the site [9]. The creation of privately-owned public open space is an urban zoning regulation that aims to provide public open space and green structures in the densest areas of the city that complement, extend or integrate with the city's overall green infrastructure, in addition to providing a variety of socio-economic benefits (see Figure 1). They are not intended to replace parks and other public spaces, but to prioritise the interests of users by providing suitable places for work and leisure [6].

Figure 1. The public open space values of private property [Source: construction by authors]

To this day, New York's POPS programme has evolved with human and technological growth, without limiting public outdoor space to the creation of plazas or arcades. Private public space has kept pace with trends, changing design requirements, incorporating the needs of the public and respecting their changing tastes [12]. For almost 100 years, the solution to the problem has been developed over a long process, looking at different aspects of the urban environment with the main idea of improving the environment and the quality of human life.

The main reasons why the private property approach to public realm planning has gained wide acceptance in major cities in many parts of the world are:

- a cost-effective, free way to get public open space without the city having to spend its own money;
- an efficient use of land and space;
- benefits citizens by providing recreational and social spaces [9; 1].

Privately owned public outdoor spaces play an important role in the city's network of public outdoor spaces and function well when connected to other urban spaces - streets, parks, squares and other public outdoor spaces. They should function as a layer of the city's public open spaces, filling gaps where needed, creating new points of attraction and focus, protecting views and the uniqueness of spaces, and contributing to the revitalisation of the public realm.

There is no one specific type of privately owned public open space, as they can be combined or integrated in different ways, but the main unifying feature is the ownership of the property by a private owner and its aim to provide a complement to the public open space and green infrastructure in the

city. The ways in which privately owned public open spaces can be subdivided are varied, with four of the most common being listed below (see Table 1).

When new public spaces are developed on private property, their type and form will always be adapted to the character and context of the place, creating new hybrid spaces, such as a town square that will serve as a forecourt, or a courtyard that will serve as a stopping point and be walkable. The general classification includes the following types of spatial outdoor spaces:

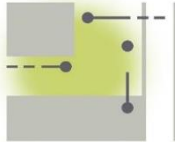
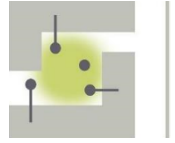
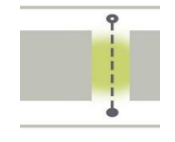
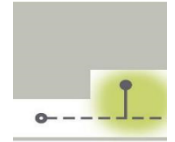
- Courtyards - landscaped open space, contained within a building block, limited or with direct street frontage connection;
- Town squares (plazas) - a gathering place connected to the street, predominantly hard surfaced, intended for a wider range of activities;
- Gardens - landscaped space of intimate scale, open to the street space, providing maximum sunlight during the day;
- Walkways and mid-block connections - exterior of the pavement at street level;
- Forecourts - landscaped open space between the public sidewalk and the main building entrance;
- Landscaped setbacks or pocket space - landscaped, small-scale open space between building frontages and the street - an extension of the pavement;
- Promenade - linear space providing passive recreation and pedestrian transit [1; 2].

In addition to the above, the outdoor space of privately-owned property accessible to the public includes supermarket car parks, hotel surroundings, the outdoor space of commercial buildings and other components of the urban environment that are not owned by the state or the municipality but are used on a daily basis by residents, visitors or employees and are owned by a private owner.

The development and value of public open spaces is also widely debated at the global level, where SDG 11 of the UN Development Agenda, "Sustainable Cities and Communities", states that by 2030, cities and human settlements should be made inclusive, safe, adaptable and sustainable, with the aim of ensuring the availability of safe, inclusive and accessible green and public spaces, especially for women, children, seniors and people with disabilities [13]. The objective brings to the fore sustainable and inclusive urban planning models to address and contain the rapid urbanisation process in major cities. The strategy highlights the need for the future development of a functionally connected and distributed network of green public open spaces. Within its framework, the Global Public Space Programme has been established to focus attention on the importance of public open space as a fundamental element in creating sustainable urban environments, ensuring a high quality of life for all.

TABLE 1

Types of private outdoor spaces to be used by public open access [construction by authors based on Kayden [8]]

Typology	Pattern	Characteristics
Destination space		Place attracts visitors from outside the immediate area who are not regular visitors, the space is usually designed for a larger number of people and is attractive in its own right.
Neighbourhood space		The site is mainly visited by residents and/or employees from the local area and is most often closely linked to the adjacent street and/or development it serves or includes. These types of premises are of high quality and include a range of amenities.
Circulation space		An aesthetic and high-quality space used by the person to move from point A to point B.
Hiatus space		Place serves as a stopping place for a passing or travelling visitor to sit down or provide other amenities, intended for a short period of time.

Over the years, the programme has evolved to the development of methodologies, assessments and approaches that include both normative and design tools for the development of high quality, safe, inclusive, accessible and green public spaces- [10].

A good and even coverage of green spaces in urban areas is an essential tool to balance the grey structure, in addition to providing ecological functions such as creating green connections to restore ecological, environmental connectivity and ensure biodiversity. The role of public open space in providing ecological services is important for global challenges such as climate change mitigation and adaptation strategies. Most cities have already gone a step further in developing green urban spaces - renaturalizing previously deprived and built-up areas, creating new knowledge and experiences to bring ecosystems back into everyday lives [4].

One of the indicators for a sustainable urban environment is the proportion of public and green space in a city. Urban green spaces create an enjoyable living environment and an attractive urban image, which is an integral part of everyday life and an aesthetic component of the environment. It is part of a wider green infrastructure with an important role in improving the quality of the public realm:

- Urban biodiversity maintained and protected;
- Reduced environmental hazards such as noise and air pollution;
- Reduced adverse impacts of extreme weather events on human health;
- Increased overall urban quality of life and health and well-being of the population [15].

The "greenness" of European cities has increased by 38% over the last 25 years. Around 44% of Europe's urban population now lives within 300 m of a public park, demonstrating that landscaped public and green spaces can have many benefits – improved overall air quality, safety, social inclusion, health and microclimate regulation. The World Health Organisation recommends 9 m² of public green space per capita. While other cities find it difficult to meet this minimum, others such as Italy set a minimum of 18 m² of public green space per person for new developments. In Latvia, the average amount of public green space per inhabitant is 27.3 m² [3].

Results and Discussions

A well-designed, condition-appropriate public realm is not enough to contribute to a quality living environment. The maintenance of outdoor spaces is crucial, which in many cases is neglected due to financial constraints. The cost of maintaining open space must be fixed and reserved from the moment it is created. Following recommendations of management and maintenance requirements are

offered for local governments to deal with the public open spaces in private properties:

- Ensure accessibility – define the range of activities allowed in the open space – from everyday social activities such as strolling, temporary recreation, which is a non-negotiable requirement, to the commercial conditions that are allowed;
- Depending on the intended use, the type, size and significant characteristics of the outdoor space, create a programme, similar to the San Francisco the "1% Art Programme", allocating 1% of the construction costs to the introduction of art, environmental or any other urban elements in the public outdoor space – contributing to its identity and uniqueness;
- Quality control and penalties system introduction – every year or season, the municipality carries out a quality control of the outdoor space, recording its compliance with the quality requirements and conditions;
- Attracting investors – rewards, discounts for creating, enhancing and maintaining public open spaces. The municipality can co-finance the project at the time of design and construction, covering a share of the costs, in return for the investor's commitment (in a contract) to maintain the public open space on private property.

Based on the literature research carried out during the study, thematic models for private public outdoor spaces are proposed, based on real-life situations in urban outdoor spaces. It proposes to design optimal public outdoor spaces, incorporating best practices in design and layout development, and emphasising the inclusion of green structures. As already indicated above, the types of public open spaces on private property are distinguished, which are also the most frequent in urban open spaces.

Destination space

The type of outdoor space of the destination space corresponds to the type of outdoor space of gardens and squares, which would be privately owned and publicly accessible. Such outdoor space is characterised by its main attractions, which define the uniqueness of the place and are the reason why people go there in the first place and not just to pass through. The model of the type of outdoor space of a destination space was conceptualised based on the existing situation of similar areas of such use (see Figure 2).

For the type of destination's space, it is important to create its uniqueness or attraction, which creates a certain sense of place. This can be an artistic or environmental landmark or element that dominates the place, or a service, or an atmosphere, something that will distinguish the outdoor space from others and attract users to it.

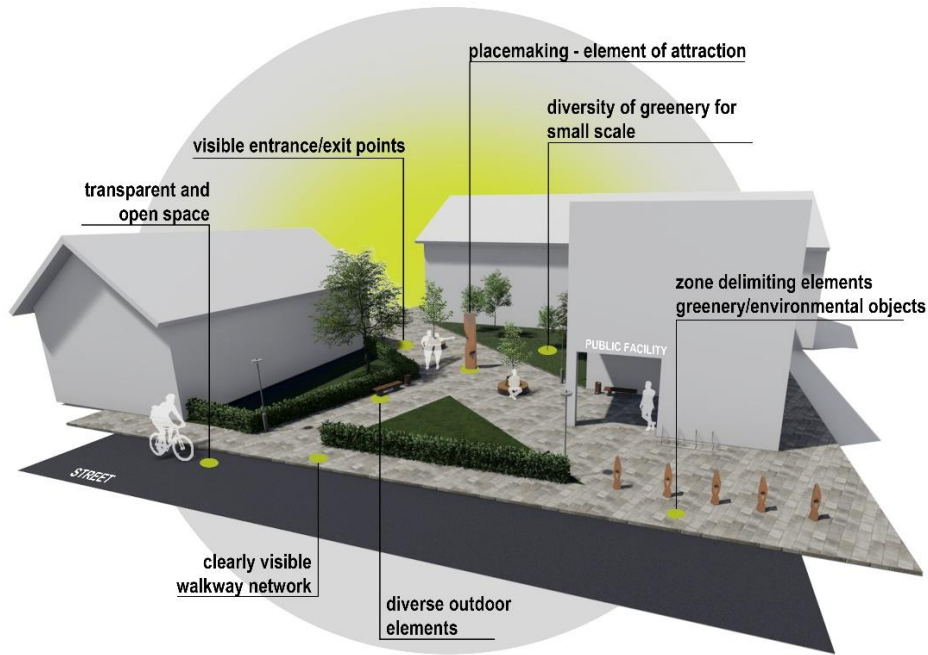


Fig. 2. Destination-type outdoor space model [construction by authors]



Fig. 3. Neighbourhood space model [construction by authors]

In terms of the structure of the spatial planning, a clear study of the directions of movement is initially needed, with legible paths, no dead ends, understandable entry and exit points that are at the same time clearly visible. The green structure provides the spatial framework and, depending on the scale of the outdoor space, its relevance to the human scale of the outdoor space. Regardless of the type of outdoor space, it should provide a green structure and connectivity with the public pavement and street in at least one part, forming a physical

boundary with the aim of emphasising the more private atmosphere of the outdoor space, which is nevertheless also public.

Neighbourhood space

Neighbourhood space corresponds to the large-scale outdoor space associated with the use of the surrounding buildings, most often courtyards and squares used by visitors, employees, etc. of those buildings. The model is partly conceptual, based on the outdoor space of the shopping centre - the car park (see Figure 3).

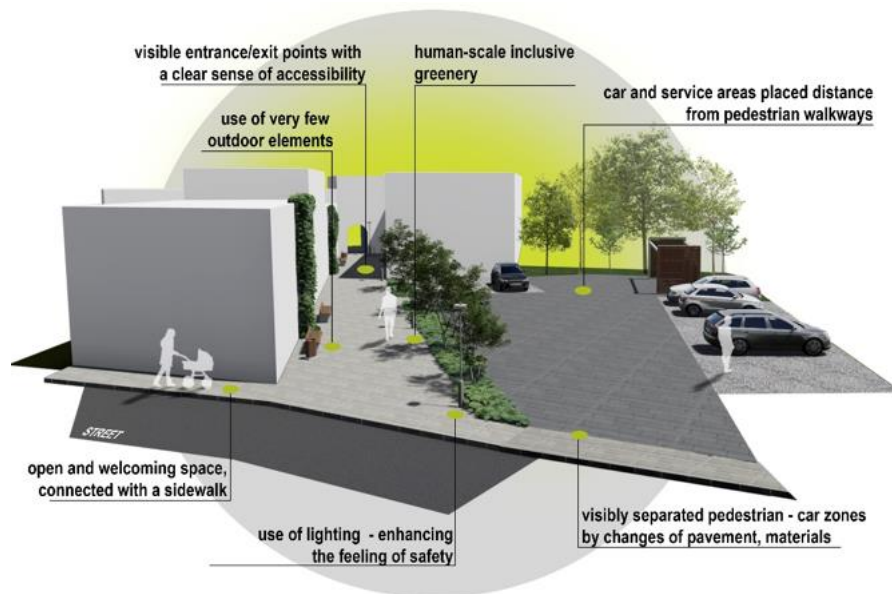


Fig. 4. Walkable outdoor space model [construction by authors]

The provision of green space is important in the public open space of such large area as a shopping centre, which, given its function as a parking area and the large size of the site, needs to be balanced while maintaining the transparency, aesthetics, connectivity and functionality of the open space. The design of the large-scale outdoor space should incorporate the perception of its landscape from external viewpoints, addressing their sightlines, key axes and visual impact on the surrounding environment. To avoid creating a break point in the landscape, the outdoor space should retain large trees and be complemented by multi-stemmed, medium-sized trees that provide a variety of ecosystem services – shading, microclimate enhancement, incorporation of scale and visual, functional connection to the surrounding structure. It is also recommended that planting be provided as sustainable stormwater management solutions.

In order to achieve a safe integration of pedestrians into the accessibility of the internal outdoor space, it is necessary to introduce pedestrian routes from the main external access points, which are formed by public institutions with a high number of visitors located in the adjacent area. Such pedestrian routes can be visually highlighted by different pavements and their transitional sections need to be spatially separated by plantings. A balance should be struck between the proportions of greenery and open space, so that the possibility of transforming the open space for other uses is not lost.

Its entrance portal must be inviting, open and clearly legible. It is desirable to create temporary recreation areas in its vicinity, with provision for landscaping. For users of the neighbourhood space,

where its nature requires it, create landscaped outdoor recreation areas.

Circulation space

The type of walkable outdoor space corresponds mainly to the street connection sections, which should provide an aesthetic and safe movement from point A to B. The model was based on real examples of walkable outdoor spaces (see Figure 4).

In the proposed model, the public open space includes both a major pedestrian route and car parking spaces, the boundaries of which are unclear. The proposal includes the physical and visual separation of these spaces from each other through planting. Due to the small scale of the outdoor space, use medium height, multi-stemmed tree planting that clearly marks the direction of pedestrian movement, the main axis and does not separate it from the street space. The connection to the two streets is vital for such an outdoor space and has the most direct influence on its use, therefore there can be no level or other barriers. The perceptibility of the outdoor space, due to its configuration and dimensions, should promote a safe, inviting feeling, with a visible exit. Therefore, the quality of the surface and the lighting are the key landscaping elements in a pedestrianised outdoor space. Secondary are recreational elements such as seating, cycle racks, bins, which depend on the use of visitors from the surrounding buildings but may be provided to a minimum.

Hiatus space

The type of outdoor space most commonly used for stopping (circulation) places is the sidewalk extension or "pocket" type of outdoor space or

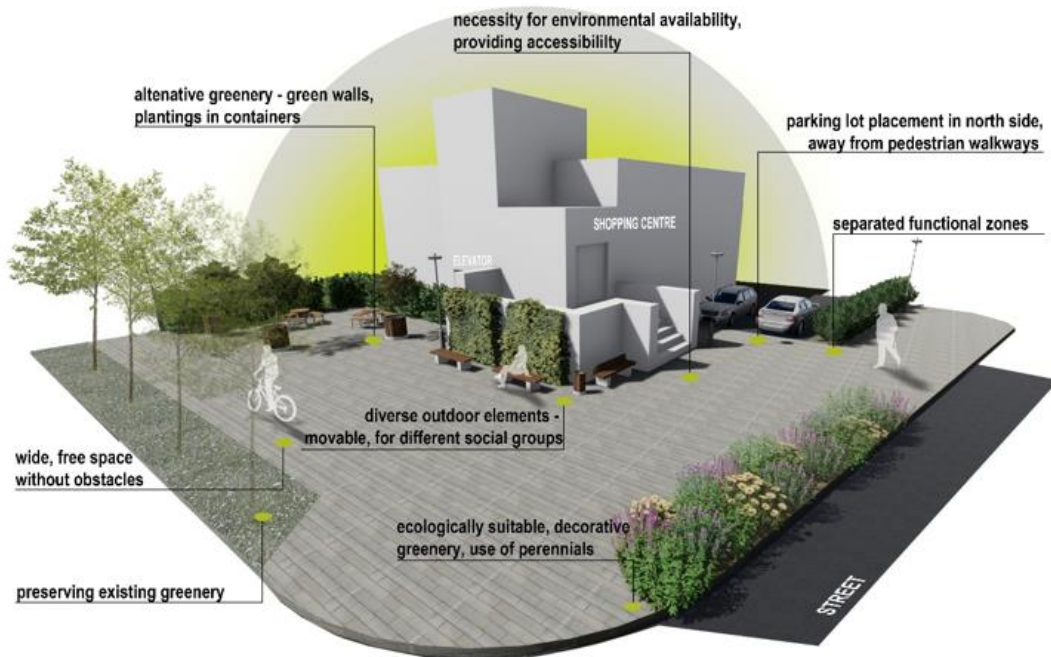


Fig. 5. Model of a hiatus space [construction by authors]

forecourt. Their main function is to provide a temporary residence facility, typically small in scale and connected to pedestrian transitway segments (see Figure 5).

Given the lack of green structure and landscape quality in such outdoor areas, which are related to the monolithic style of the buildings, the proposal includes complementing the green structure with alternative planting solutions such as tree planting in movable pots and vertical green walls in the recreation space, as well as planting enclosing the zone and the street space. Existing green structures complement the functional use of the outdoor space - seasonally changing, colourful ornamental planting is important as a stopover and 'calling card' outdoor space, emphasising the identity of the city and leaving an impression during temporary use of the outdoor space.

In the layout of the space, a public outdoor space for recreation can be located nearby one side of the building, facing some public institution for example the bus station. Pedestrian transit should be provided in a large space, without obstructions, with the possibility to stop and linger, as well as a direct connection to the public pavement, without level or other distinctions. This requires the provision of various types of amenities – bike racks, lighting, seating, bins.

Conclusions

During the spatial planning of urban environment with the emergence of new centres is not only about increasing housing stock and business opportunities through the sale of developable land, but about doing so in a measured way that considers all the elements necessary for a healthy and viable city, including public open space outside existing and developed centres. In addition, continuing these connections to the existing urban and external green fabric ensures a seamless network and accessibility of places, building on the ideology of city design, from the planning of living spaces to the development of buildings.

Any municipality concerned about the well-being and health of its residents and visitors should start by creating a landscape plan or programme that sets out how the green fabric will be developed beyond the city centre. On the basis of such a landscape plan and the planned use of the area, the spatial and green structure of the areas to be developed becomes clearer. The green network and interconnections defined in the landscape plan can, judging by the existing situation, be created by green corridors and green interspaces, which can also be provided by the public open spaces of private properties. As these are privately owned outdoor spaces, but included as part of a larger system, it is important to develop their spatial planning conditions to maximise their functionality, accessibility and coherence, also encouraging the development of green circles.

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Kopsavilkums. Kopš industrializācijas laikmeta iestāšanās novērojama tendence, kam raksturīga lielāko pilsētu radiālā izplešanās, strauja to apbūve un cilvēku koncentrēšanās tajās. Jau vēsturiski cilvēku saskarsmei un komunikācijai bija nepieciešama telpa ārpus mājas, ko pilsētā sniedza publiskā ārtelpa, veidojot sabiedriskās dzīves centrus. Mainoties laikmetiem un pastāvošām varām, vienlaikus arī mainoties apbūves apjomiem, drošības apsvērumiem un īpašumtiesībām uz telpu pilsētā, mainīgi bijuši arī cilvēku ārtelpas izmantošanas apstākļi un iespējas. Pētījuma mērķis ir izpētīt privātpašumu publiskās ārtelpas būtību un to iespējamās attīstības piensumu pilsētvides zaļajai infrastruktūrai, izstrādājot dizaina un plānošanas rekomendācijas privātpašumu publiskās ārtelpas attīstībai pilsētvidē. Veiktais pētījums parāda tēmas, kā privātpašumu publiskā ārtelpa tiek skatīta, aktualitāti lielākajās pasaules metropolēs, taču idejiski to ir iespējams pielāgot mazāka mēroga pilsētu plānošanai, piemēram, attiecināt uz privātiem investoriem un attīstītājiem, prasībās pret jaunbūvēm.